

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled).
2. (Canceled).
3. (Currently Amended) ~~The~~ A load distribution device ~~according to claim 2~~ provided in each of nodes in a network, comprising:
 - a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;
 - a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and
 - a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,
 - wherein the router determiner comprises:
 - a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and
 - a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,
 - wherein the route candidate selector selects a route candidate having a broadest available bandwidth as the route for a requested connection.
4. (Currently Amended) ~~The~~ A load distribution device ~~according to claim 2~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in a round robin fashion.

5. (Currently Amended) ~~The~~ A load distribution device according to ~~claim 2~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in a weighted round robin fashion using an available bandwidth of each of the route candidates as a weight.

6. (Currently Amended) The A load distribution device according to ~~claim 2~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate having a shortest delay time as the route for a requested connection among the route candidates satisfying a requested quality.

7. (Currently Amended) The A load distribution device according to ~~claim 2~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate having a smallest fluctuation in data arrival interval as the route for a requested connection among the route candidates satisfying a requested quality.

8. (Currently Amended) The A load distribution device according to ~~claim 2~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in a weighted round robin fashion using a reciprocal of delay time for each of the route candidates as a weight.

9. (Currently Amended) The A load distribution device according to ~~claim 2~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in a weighted round

robin fashion using a reciprocal of fluctuation in data arrival interval for each of the route candidates as a weight.

10. (Currently Amended) The load distribution device according to claim [[2]] 3, further comprising:

an on-demand route calculator for calculating a route satisfying a requested quality by referring to the link state memory when no route candidate is found in the route candidate selector.

11. (Currently Amended) The load distribution device according to claim [[1]] 3, further comprising:

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

12. (Currently Amended) The load distribution device according to claim 11, wherein the alternate route determiner comprises:

[[a]] an alternate route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a failure notification message; and

[[a]] an alternate route candidate selector for selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.

13. (Currently Amended) ~~The~~ A load distribution device ~~according to claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate having a broadest available bandwidth as the alternate route for failure recovery.

14. (Currently Amended) The A load distribution device according to ~~claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is

selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route candidates in a round robin fashion.

15. (Currently Amended) ~~The~~ A load distribution device ~~according to claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route candidates in a weighted round robin fashion using an available bandwidth of each of the route candidates as a weight.

16. (Currently Amended) ~~The~~ A load distribution device ~~according to claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate having a shortest delay time as the alternate route for failure recovery among the route candidates satisfying a required quality.

17. (Currently Amended) The A load distribution device ~~according to claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate having a smallest fluctuation in data arrival interval as the alternate route for failure recovery among the route candidates satisfying a required quality.

18. (Currently Amended) The A load distribution device ~~according to claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route candidates in a weighted round robin fashion using a reciprocal of delay time for each of the route candidates as a weight.

19. (Currently Amended) The A load distribution device according to ~~claim 12~~ provided in each of nodes in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability; and

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability,

wherein the alternate router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route candidates in a weighted round robin fashion using a reciprocal of fluctuation in data arrival interval for each of the route candidates as a weight.

20. (Currently Amended) The load distribution device according to claim [[12]] 13, further comprising:

an on-demand route calculator for calculating an alternate route satisfying a required quality by referring to the link state memory when no route candidate is found in the route candidate selector.

21. (Currently Amended) A node in a network, comprising:

a connection setup request receiver;

a connection setup processor;

a link state memory retrievably storing link state information of the network, wherein the link state database is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection to set up the requested connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in at least one of: a) a round robin fashion, b) a broadest available bandwidth, c) a weighted round robin fashion using an available bandwidth of each of the route candidates as a weight, d) a shortest delay time, e) a smallest fluctuation in data arrival interval, f) a weighted round robin fashion using a reciprocal of delay time as a weight, and g) a weighted round robin fashion using a reciprocal of fluctuation in data arrival interval as a weight.

22. (Canceled).

23. (Original) The node according to claim 21, further comprising:

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

24. (Currently Amended) The node according to claim 23, wherein the alternate route determiner comprises:

[[a]] an alternate route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a failure notification message; and

[[a]] an alternate route candidate selector for selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.

25. (Original) The node according to claim 21, further comprising:
a link state memory controller for updating at least the link state memory when one of a link state message and a failure notification message is received.

26. (Currently Amended) A load distribution method in each of nodes included in a network, comprising the steps of:

a) retrievably storing link state information of the network, wherein the link state database is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

b) retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

c) determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the step (c) comprises the steps of:

c1) checking quality of each of the route candidates by referring to the link state information when receiving a connection setup request; and

c2) selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the step c2) selects a route candidate as the route for a requested connection from the route candidates in at least one of: a) a round robin fashion, b) a broadest available bandwidth, c) a weighted round robin

fashion using an available bandwidth of each of the route candidates as a weight, d) a shortest delay time, e) a smallest fluctuation in data arrival interval, f) a weighted round robin fashion using a reciprocal of delay time as a weight, and g) a weighted round robin fashion using a reciprocal of fluctuation in data arrival interval as a weight.

27. (Canceled).

28. (Original) The load distribution method according to claim 26, further comprising the step of:

d) determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

29. (Original) The load distribution method according to claim 28, wherein the step (d) comprises the steps of:

checking quality of each of the route candidates by referring to the link state information when receiving a failure notification message; and

selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.

30. (Currently Amended) A recording medium storing a computer program for performing a load distribution operation in each of nodes included in a network, the computer program comprising the steps of:

a) retrievably storing link state information of the network, wherein the link state database is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

b) retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

c) determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the step (c) comprises the steps of:

c1) checking quality of each of the route candidates by referring to the link state information when receiving a connection setup request; and

c2) selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates,

wherein the step c2) selects a route candidate as the route for a requested connection from the route candidates in at least one of: a) a round robin fashion, b) a broadest available bandwidth, c) a weighted round robin fashion using an available bandwidth of each of the route candidates as a weight, d) a shortest delay time, e) a smallest fluctuation in data arrival interval, f) a weighted round robin fashion using a reciprocal of delay time as a weight, and g) a weighted round robin fashion using a reciprocal of fluctuation in data arrival interval as a weight.

31. (Canceled).

32. (Original) The recording medium according to claim 30, further comprising the step of:

d) determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

33. (Original) The recording medium according to claim 32, wherein the step (d) comprises the steps of:

checking quality of each of the route candidates by referring to the link state information when receiving a failure notification message; and

selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.

34. (New) A load distribution device provided in each of nodes in a network that also contains links connecting the nodes, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state memory is used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability,

wherein the router determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request;

a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates; and

a route calculator for calculating the plurality of route candidates and for storing the plurality of route candidates in the route candidate memory,

wherein the route calculator determines at least two route candidates for each of the possible endpoint nodes such that the nodes and the links of the network that are assigned to the at least two route candidates are not shared among the at least two route candidates, to a greatest possible extent.